

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 4 -

October 12, 2006

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

Claims 1-43 (canceled).

44 (currently amended). A dental handpiece comprising:  
an elongated body having a longitudinal axis;  
a seat positioned at one end of said body;  
a head rotatably mounted on said seat, said head being rotatable about a first axis of rotation oriented angularly with respect to said longitudinal axis, said head having a center of rotation co-incident with said longitudinal axis;

a dental instrument mounted on said head and rotatable about a second axis of rotation, wherein rotation of said head about said first axis of rotation changes the orientation of said second axis of rotation relatively to said longitudinal axis, said head being rotatable to an orientation wherein said second axis of rotation is coaxial with said longitudinal axis;

an air turbine rotatably mounted within said head and connected to said dental instrument, said dental instrument being rotated by said air turbine;

an air inlet positioned within said head in fluid communication with said turbine;

an air outlet positioned within said head in fluid communication with said turbine;

an inlet channel positioned within said body and said head, said channel being in fluid communication with said

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 5 -

October 12, 2006

air inlet and providing compressed air thereto for rotating said turbine; and

an exhaust channel positioned within said head, said exhaust channel being in fluid communication with said air outlet for discharging air from said turbine.

Claim 45 (canceled).

46 (previously presented). A dental handpiece according to Claim 44, wherein said first axis of rotation is oriented at about a 45° angle relatively to said longitudinal axis.

47 (previously presented). A dental handpiece according to Claim 44, wherein said head is positionable at a plurality of discrete rotational orientations.

48 (previously presented). A dental handpiece according to Claim 44, wherein said head frictionally engages said seat, friction between said head and said seat holding said head in a predetermined rotational orientation relatively to said longitudinal axis.

49 (previously presented). A dental handpiece according to Claim 44, wherein said second axis of rotation intersects said center of rotation of said head.

50 (previously presented). A dental handpiece according to Claim 44, further comprising:

a shaft rotatably mounted within said body;  
a first gear rotatably mounted within said body adjacent to said head, said first gear being engaged with said

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 6 -

October 12, 2006

shaft such that rotation of said shaft rotates said first gear; and

a second gear rotatably mounted within said seat and attached to said head such that rotation of second gear rotates said head about said first axis of rotation, said first gear being engaged with said second gear, wherein rotation of said shaft rotates said head about said first axis of rotation by rotating said first and second gears.

51 (previously presented). A dental handpiece according to Claim 50, further comprising:

a speed reducer engaged with an end of said shaft opposite said first gear; and

a micromotor engaged with said speed reducer, wherein actuation of said micromotor rotates said shaft, rotation of said shaft rotating said head about said first axis of rotation.

52 (previously presented). A dental handpiece according to Claim 44, wherein said head has a hemispherical outer surface.

53 (currently amended). A dental handpiece according to Claim 52, wherein said one end of said body has a ~~hemisphereical~~ hemispherical outer surface overlying said seat.

54 (previously presented). A dental handpiece according to Claim 53, wherein said hemispherical outer surfaces of said head and said end of said body have substantially the same radius, and wherein the centers of said outer surfaces are substantially coincident.

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 7 -

October 12, 2006

55 (previously presented). A dental handpiece according to Claim 44, further comprising:

a first light guide extending through said body and terminating adjacent to said head; and

a second light guide positioned within said head and having a light inlet in communication with said first light guide and a light outlet positioned adjacent to said dental instrument.

56 (previously presented). A dental handpiece according to Claim 55, further comprising a cleaning air channel positioned in said head, said cleaning air channel having a cleaning air outlet oriented so as to direct a stream of air across said light outlet.

57 (currently amended). A dental handpiece comprising:  
an elongated body having a longitudinal axis;  
a seat positioned at one end of said body;  
a head rotatably mounted on said seat, said head being rotatable about a first axis of rotation oriented at about a 45° angle with respect to said longitudinal axis, said head having a center of rotation co-incident with said longitudinal axis;

a dental instrument mounted on said head and rotatable about a second axis of rotation, wherein rotation of said head about said first axis of rotation changes the orientation of said second axis of rotation relative to said longitudinal axis, said head being rotatable to an orientation wherein said second axis of rotation is coaxial with said longitudinal axis;

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 8 -

October 12, 2006

an air turbine rotatably mounted within said head and connected to said dental instrument, said dental instrument being rotated by said air turbine;

an air inlet positioned within said head in fluid communication with said turbine;

an air outlet positioned within said head in fluid communication with said turbine;

an inlet channel positioned within said body and said head, said channel being in fluid communication with said air inlet and providing compressed air thereto for rotating said turbine; and

an exhaust channel positioned within said head, said exhaust channel being in fluid communication with said air outlet for discharging air from said turbine.

Claim 58 (canceled).

59 (previously presented). A dental handpiece according to Claim 57, wherein said head has a hemispherical outer surface.

60 (currently amended). A dental handpiece according to Claim 59, wherein said one end of said body has a ~~hemispherical~~ hemispherical outer surface overlying said seat.

61 (previously presented). A dental handpiece according to Claim 60, wherein said hemispherical outer surfaces of said head and said end of said body have substantially the same radius, and wherein the centers of said outer surfaces are substantially coincident.

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 9 -

October 12, 2006

62 (currently amended). A dental handpiece comprising:  
an elongated body having a longitudinal axis;  
a seat positioned at one end of said body;  
a head rotatably mounted on said seat, said head  
being rotatable about a first axis of rotation oriented at  
about a 45° angle with respect to said longitudinal axis, said  
head having a center of rotation co-incident with said  
longitudinal axis;

a dental instrument mounted on said head and  
rotatable about a second axis of rotation that intersects said  
center of rotation of said head, wherein rotation of said  
head about said first axis of rotation changes the orientation  
of said second axis of rotation relatively to said  
longitudinal axis, said head being rotatable to an orientation  
wherein said second axis of rotation is coaxial with said  
longitudinal axis;

an air turbine rotatably mounted within said head  
and connected to said dental instrument, said dental  
instrument being rotated by said air turbine;

an air inlet positioned within said head in fluid  
communication with said turbine;

an air outlet positioned within said head in fluid  
communication with said turbine;

an inlet channel positioned within said body and  
said head, said channel being in fluid communication with said  
air inlet and providing compressed air thereto for rotating  
said turbine; and

an exhaust channel positioned within said head, said  
exhaust channel being in fluid communication with said air  
outlet for discharging air from said turbine.

Claim 63 (canceled).

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 10 -

October 12, 2006

64 (previously presented). A dental handpiece according to Claim 62, wherein said head has a hemispherical outer surface.

65 (currently amended). A dental handpiece according to Claim 64, wherein said one end of said body has a ~~hemispherical~~ hemispherical outer surface overlying said seat.

66 (previously presented). A dental handpiece according to Claim 65, wherein said hemispherical outer surfaces of said head and said end of said body have substantially the same radius, and wherein the centers of said outer surfaces are substantially coincident.

67 (new). A dental handpiece comprising:  
an elongated body having a longitudinal axis;  
a seat positioned at one end of said body;  
a head rotatably mounted on said seat, said head being rotatable about a first axis of rotation oriented angularly with respect to said longitudinal axis, said head having a center of rotation co-incident with said longitudinal axis;

a dental instrument mounted on said head and rotatable about a second axis of rotation, wherein said second axis of rotation intersects said center of rotation of said head, and rotation of said head about said first axis of rotation changes the orientation of said second axis of rotation relatively to said longitudinal axis;

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 11 -

October 12, 2006

an air turbine rotatably mounted within said head and connected to said dental instrument, said dental instrument being rotated by said air turbine;

an air inlet positioned within said head in fluid communication with said turbine;

an air outlet positioned within said head in fluid communication with said turbine;

an inlet channel positioned within said body and said head, said channel being in fluid communication with said air inlet and providing compressed air thereto for rotating said turbine; and

an exhaust channel positioned within said head, said exhaust channel being in fluid communication with said air outlet for discharging air from said turbine.

68 (new). A dental handpiece comprising:

an elongated body having a longitudinal axis;

a shaft rotatably mounted within said body;

a seat positioned at one end of said body;

a head rotatably mounted on said seat, said head being rotatable about a first axis of rotation oriented angularly with respect to said longitudinal axis, said head having a center of rotation co-incident with said longitudinal axis;

a first gear rotatably mounted within said body adjacent to said head, said first gear being engaged with said shaft such that rotation of said shaft rotates said first gear;

a second gear rotatably mounted within said seat and attached to said head such that rotation of second gear rotates said head about said first axis of rotation, said first gear being engaged with said second gear, wherein



RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 12 -

October 12, 2006

rotation of said shaft rotates said head about said first axis of rotation by rotating said first and second gears;

a speed reducer engaged with an end of said shaft opposite said first gear;

a micromotor engaged with said speed reducer, wherein actuation of said micromotor rotates said shaft, rotation of said shaft rotating said head about said first axis of rotation;

a dental instrument mounted on said head and rotatable about a second axis of rotation, wherein rotation of said head about said first axis of rotation changes the orientation of said second axis of rotation relatively to said longitudinal axis;

an air turbine rotatably mounted within said head and connected to said dental instrument, said dental instrument being rotated by said air turbine;

an air inlet positioned within said head in fluid communication with said turbine;

an air outlet positioned within said head in fluid communication with said turbine;

an inlet channel positioned within said body and said head, said channel being in fluid communication with said air inlet and providing compressed air thereto for rotating said turbine; and

an exhaust channel positioned within said head, said exhaust channel being in fluid communication with said air outlet for discharging air from said turbine.

69 (new). A dental handpiece comprising:

an elongated body having a longitudinal axis;

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 13 -

October 12, 2006

a seat positioned at one end of said body, said one end of said body having a hemispherical outer surface overlying said seat;

a head having a hemispherical outer surface and being rotatably mounted on said seat, said head being rotatable about a first axis of rotation oriented angularly with respect to said longitudinal axis, said head having a center of rotation co-incident with said longitudinal axis, said hemispherical outer surfaces of said head and said end of said body having substantially the same radius, the centers of said outer surfaces being substantially coincident;

a dental instrument mounted on said head and rotatable about a second axis of rotation, wherein rotation of said head about said first axis of rotation changes the orientation of said second axis of rotation relatively to said longitudinal axis;

an air turbine rotatably mounted within said head and connected to said dental instrument, said dental instrument being rotated by said air turbine;

an air inlet positioned within said head in fluid communication with said turbine;

an air outlet positioned within said head in fluid communication with said turbine;

an inlet channel positioned within said body and said head, said channel being in fluid communication with said air inlet and providing compressed air thereto for rotating said turbine; and

an exhaust channel positioned within said head, said exhaust channel being in fluid communication with said air outlet for discharging air from said turbine.

70 (new). A dental handpiece comprising:

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 14 -

October 12, 2006

an elongated body having a longitudinal axis;  
a seat positioned at one end of said body, said one end of said body having a hemispherical outer surface overlying said seat;

a head having a hemispherical outer surface and being rotatably mounted on said seat, said head being rotatable about a first axis of rotation oriented at about a 45° angle with respect to said longitudinal axis, said head having a center of rotation co-incident with said longitudinal axis, said hemispherical outer surfaces of said head and said end of said body having substantially the same radius, the centers of said outer surfaces being substantially coincident;

a dental instrument mounted on said head and rotatable about a second axis of rotation, wherein rotation of said head about said first axis of rotation changes the orientation of said second axis of rotation relative to said longitudinal axis;

an air turbine rotatably mounted within said head and connected to said dental instrument, said dental instrument being rotated by said air turbine;

an air inlet positioned within said head in fluid communication with said turbine;

an air outlet positioned within said head in fluid communication with said turbine;

an inlet channel positioned within said body and said head, said channel being in fluid communication with said air inlet and providing compressed air thereto for rotating said turbine; and

an exhaust channel positioned within said head, said exhaust channel being in fluid communication with said air outlet for discharging air from said turbine.

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 15 -

October 12, 2006

71 (new). A dental handpiece comprising:

- an elongated body having a longitudinal axis;
- a seat positioned at one end of said body, said one end of said body having a hemispherical outer surface overlying said seat;
- a head having a hemispherical outer surface and being rotatably mounted on said seat, said head being rotatable about a first axis of rotation oriented at about a 45° angle with respect to said longitudinal axis, said head having a center of rotation co-incident with said longitudinal axis, said hemispherical outer surfaces of said head and said end of said body having substantially the same radius, the centers of said outer surfaces being substantially coincident;
- a dental instrument mounted on said head and rotatable about a second axis of rotation that intersects said center of rotation of said head, wherein rotation of said head about said first axis of rotation changes the orientation of said second axis of rotation relatively to said longitudinal axis;
- an air turbine rotatably mounted within said head and connected to said dental instrument, said dental instrument being rotated by said air turbine;
- an air inlet positioned within said head in fluid communication with said turbine;
- an air outlet positioned within said head in fluid communication with said turbine;
- an inlet channel positioned within said body and said head, said channel being in fluid communication with said air inlet and providing compressed air thereto for rotating said turbine; and

RESPONSE TO OFFICE ACTION  
DATED SEPTEMBER 12, 2006

Appln. No. 10/653,308

- 16 -

October 12, 2006

an exhaust channel positioned within said head, said exhaust channel being in fluid communication with said air outlet for discharging air from said turbine.